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Woven fabrics — Distortion — Determination of skew and bow

Étoffes tissées — Déformation — Détermination de l'écart angulaire et du cintrage

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Foreword

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The committee responsible for this document is ISO/TC 38, *Textiles*, Subcommittee SC 24, *Conditioning atmospheres and physical tests for textile fabrics*.

Introduction

Textile and clothing manufacturers give a lot of importance to knowledge of the widthway distortion. In the case of woven fabrics with patterns or in which the weft threads are rather visible, the appearance of a textile article could be compromised.

With some rare exceptions, the two sets of threads in woven textile fabrics are intended to lie straight and at right angles. If a fabric does not meet either of these requirements, it is described as distorted. Difficulties in making up may then arise and the made-up article may fail to function properly. The distortion may also detract from the appearance of fabric with checked patterns or coloured weft effects such as plaids or stripes. It is therefore desirable to have a means of specifying and measuring the distortion in woven fabric in terms of bow and skew.

Woven fabrics — Distortion — Determination of skew and bow

1 Scope

This International Standard specifies a method for the determination of the distortion of a woven fabric in which the weft yarns are, in principle, perpendicular to the warp yarns.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 139, *Textiles — Standard atmospheres for conditioning and testing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
bow
curvature of the warp or weft of fabrics

3.2
skew
fabric condition where the picks, although straight, are not at right angles to the ends

4 Principle

In a piece of the woven fabric, laid on a flat surface and without tension, skew and bow are characterized as follows.

Overall skew is based on the determination of the distance between one end of a weft yarn and the point on the same edge intersected by a normal perpendicular from the other end of the weft yarn to the fabric edge, in proportion to the distance between two points at which the normal perpendicular to the fabric edge intersects both edges (woven fabric width), expressed as a percentage ratio.

Local skew is determined as the distance between one end of a weft yarn to its perpendiculars to the warp running at right angles to a portion of the fabric length.

Weft bow is determined (see Annex A) as the total perpendicular distance by which a weft yarn deviates from a straight line joining both ends of the weft yarn.

Warp bow is determined (see Annex A) as the greatest perpendicular distance between the edge of the fabric and a straight line joining two selected points on the edge.

NOTE Any special treatment of the laboratory sample, i.e. washing or cleaning, could be as agreed upon between the interested parties and be described in the test report (see Bibliography for examples of standardized methods).

5 Apparatus

5.1 **Set square**, or similar device with at least two sides at right angles, graduated in millimetres.

5.2 **Metallic ruler**, at least 100 cm long but not less than the overall width of the fabric under test, graduated in millimetres.

5.3 **Metallic ruler**, 20 cm in length, graduated in millimetres.

6 Conditioning and testing atmosphere

The conditioning and the testing shall be conducted in the standardized atmosphere according to ISO 139.

The conditioning of the woven fabric shall be at least 16 h.

7 Test specimens

7.1 When test specimens are taken from a bulk sample, take care to ensure that they are removed with the minimum stress applied.

7.2 Take full-width test specimens not less than 500 mm in length.

7.3 Do not take test specimens from within 1 m of the ends of a piece.

8 Procedure

8.1 General

Proceed with the measurement of the test specimen (excluding selvedges) and record the position of the selected weft yarn in relation to the nearest end of the test specimen.

8.2 Preparation by marking

Select a weft yarn and trace its course by marking successive points along its length, across the width of the test specimen, with a thin marker.

If the yarn is not clearly visible, lighting of the face side of the test specimen can accentuate the relief and so facilitate the tracing of the yarn's course.

Alternately mark and measure on the reverse side of the test specimen.

8.3 Preparation by fraying

If marking of the weft yarn is not possible, cut the woven fabric and fray it down to expose a complete weft yarn across the width of the test specimen.

8.4 Determination of the overall skew and local skew

8.4.1 General

From the line representing the weft yarn evolution, the line is modelled on the application of one or more triangles.

As each triangle is characterized by its height (identified as *a*) and its base (identified as *b*), the slope of each triangle can be calculated by the ratio of the height, *a,* and the base, *b*.

Then, the skew is expressed as the percentage of the slope.

When the line is modelled by several triangles, the highest skew is kept to represent the final result.

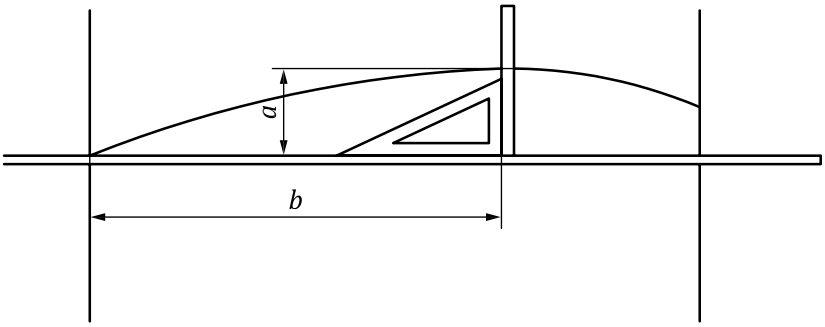
8.4.2 Measurement instructions

Measure to the nearest millimetre with the metallic ruler (5.2) the distance *b* (base) in the perpendicular direction to the warp.

Measure, with the set square and the small ruler, the distance *a* (height) in the warp direction (see Figure 1).

Note the values of the distance *a* (height) and the values of the distance *b* (base) of the related perpendicular for each slope that the line makes (see 8.4.3, 8.4.4, and 8.4.5, three examples of possible measurements in relation to the types of skew).

Measure in three different places along the length of the woven fabric in order to collect results based on three weft yarns.



Key

a height

b base

Figure 1 — Determination of the skew

8.4.3 Overall skew

Figure 2 represents the triangle model with one triangle to determine the overall skew,

where

— *a* is the maximal distance of the top of the line, measured between the top and the normal perpendicular from the beginning of the weft yarn on one fabric edge to the opposite fabric edge;

— *b* is the distance between the orthogonal projections of the beginning of the weft yarn on one fabric edge and the top of the line on the normal perpendicular to the warp (*b* represents the useful width of the woven fabric for which the selvedges are excluded).